

**Appl. No. 09/919,994**  
**Amdt. dated September 28, 2005**  
**Reply to Office Action of March 29, 2005**

### **REMARKS/ARGUMENTS**

Reconsideration of this application is respectfully requested.

Claims 1-4, 7-12, 14-26, 28, 29, and 32 are pending in the application, with claims 5, 6, 13, 27, 30, and 31 having been canceled, claims 1, 7-12 having been currently amended, new claim 32 having been added, and claims 14-26 and 28 having been withdrawn.

Claims 1-4, 27, and 29 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

According to the Examiner, "Within claims 1 and 27, the language, 'the initial unreacted diphenylmethane diisocyanate monomer', lacks antecedent basis."

Claim 1 has been amended to delete "the initial unreacted diphenylmethane diisocyanate monomer" and claim 27 has been canceled.

Accordingly, it is requested that the rejection of claims 1-4, 27, and 29 under 35 U.S.C. 112, second paragraph, be withdrawn.

Claims 1-5, 7-12, 27, 29, and 30 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

According to the Examiner:

"Applicants' claims are ambiguous, because they are drafted in such a way that it is unclear if the passages pertaining to dissolving the (unreacted) diphenylmethane diisocyanate monomer pertain to dissolving the free

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diisocyanate monomer present after prepolymer formation or dissolving the initial charge of diisocyanate monomer prior to production of the prepolymer.

Despite applicants' arguments, it is not clear from the claim language that the solvent is present from the beginning of the prepolymer formation process."

Claim 1 has been amended in an effort to clarify that the MDI is first dissolved in solvent(s), then the polyol(s) are added in an amount such that there will be a stoichiometric excess of the MDI for the reaction producing the prepolymer. After the prepolymer is formed, the excess, unreacted MDI is removed by distillation so that its concentration is less than 0.3 weight percent in the prepolymer. It is submitted that the current language of claim 1 clearly describe this and therefore it is requested that the rejection of claims 1-5, 7-12, 27, 29, and 30 under 35 U.S.C. 112, second paragraph, be withdrawn.

Claims 1-5, 7-12, 27, 29, and 30 have been rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement because, according to the Examiner, they contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

According to the Examiner:

"Firstly, within claim 1, support has not been provided for treating the residual diphenylmethane diisocyanate as claimed. As drafted, steps A) through D) of claim 1 treat the residual monomer that remains after the initial monomer has been reacted to form a prepolymer; however, the specification only provides

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support for treating the initial monomer in the manner claimed. Note that "the diphenylmethane diisocyanate monomer" within line 3 of the claim refers to the residual monomer within lines 1 and 2 of the claim."

It is submitted that the amendments to claim 1, as described above, have clarified the intended meaning of the claims and, thus, have overcome this aspect of the rejection.

"Secondly, within claims 5 and 27, the claims specify a process wherein the unreacted or excess monomer is treated by dissolution within solvent and reaction with a polyol; however, this process of treating the unreacted or residual monomer is not supported by the specification. It is noted that the claims specifically state that the unreacted or excess monomer is removed by the recited process steps."

Claims 5 and 27 have been canceled.

The Examiner continued:

"Lastly, despite applicants' response, support for amending the molecular weight of the high molecular weight polyol to be number average molecular weight has not been found. It is not seen that the argued language within page 16 of the specification provides support for the number average weight limitation as it pertains to the polyols of claim 9."

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Unfortunately, it appears that the paging of the specification provided to the Examiner differs from that available to the undersigned. There are three paragraphs, or portions thereof, in the specification that, when read together, support the references in claims 9, 11, and 12 that the molecular weights are number average molecular weights.

The first of these paragraphs, a portion, reads, "ii) a second polyol having a high molecular weight in the range of from about 400 to about 5000;" which, it is believed appears on page 10 of the Examiner's version of the specification at lines 7-8.

The second of these paragraphs reads: "The polyols are typically polyether, polyester, and polycarbonate or hydrocarbon polyols having molecular weights ranging from about 250 to about 6000. Polyols having molecular weights in the range of from about 400 to about 3000 are normally used to prepare prepolymers, although glycols or triols having molecular weights of from about 62 to about 400 can be included under certain circumstances." It is believed this paragraph appears on page 15 of the Examiner's version at lines 16-20.

The third of these paragraphs, a portion, reads: "As an illustration, consider a difunctional polyol of number average molecular weight (mw) 1000."

Those skilled in the art would realize, having considered these three disclosures in the specification in combination, that the molecular weights of the high molecular weight polyols were number average molecular weights. There are only two kinds of polymeric molecular weight, number average and weight average. Nothing is said in the entire specification about weight average molecular weights, but the language noted above, which refers to a difunctional polyol that is clearly a part of the present invention, is directed to a *number*

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*average* molecular weight. This is clearly sufficient support for use of the term "number average" in claims 9, 11, and 12.

Accordingly, it is requested that the rejection of claims 1-5, 7-12, 27, 29, and 30 under 35 U.S.C. 112, first paragraph, be withdrawn.

Claims 5, 7-12, and 30 have been rejected under 35 U.S.C. 102(b) as being anticipated by Schnabel et al. (U.S. Patent No. 4,385,171).

Claims 5 and 30 have been canceled and claims 7-12 have been amended so as to be process claims directly or indirectly dependent upon claim 1. This rejection has not been applied to claim 1.

Accordingly, it is requested that the rejection of Claims 5, 7-12, and 30 under 35 U.S.C. 102(b) as being anticipated by Schnabel et al. be withdrawn.

Claims 5, 9-12, and 30 have been rejected under 35 U.S.C. 102(b) as being anticipated by Dunlap et al. (U.S. Patent No. 4,888,442).

Claims 5 and 30 have been canceled and claims 9-12 have been amended so as to be process claims directly or indirectly dependent upon claim 1. This rejection has not been applied to claim 1.

Accordingly, it is requested that the rejection of Claims 5, 9-12, and 30 under 35 U.S.C. 102(b) as being anticipated by Dunlap et al. be withdrawn.

Claims 1-5, 7-12, 29 and 30 have been rejected under 35 U.S.C. 102(b) as being anticipated by Rosenberg et al. (U.S. Patent No. 5,703,193).

Rosenberg et al. disclose a process for reducing the amount of residual organic diisocyanate monomer in a polyurethane prepolymer reaction product mixture which comprises distilling the polyurethane prepolymer reaction product mixture in the presence of a combination of *at least one inert first solvent with a boiling point below the boiling point of the residual organic diisocyanate monomer and at least one inert second solvent with a boiling point above the boiling point of the residual organic diisocyanate monomer*, at a temperature which exceeds the vaporization temperature of the residual organic diisocyanate monomer and which is below the decomposition temperature of the polyurethane prepolymer.

The Rosenberg process requires at least two inert solvents, one having a boiling point above the boiling point of the diisocyanate and the other having a boiling point below the boiling point of the diisocyanate. The claims of the present application have been amended to require that the inert solvent or solvents employed in the practice of the present invention *all* have boiling points *below* the boiling point of the diisocyanate, i.e., the solvent or solvents are selected from the group consisting of solvents having a boiling point about 1°C to about 100°C below the boiling point of the diphenylmethane diisocyanate monomer at a pressure of 10 torr.

Rosenberg et al. nowhere disclose or suggest any benefit to be derived from the use of anything other than a combination of high and low boiling solvents and, in fact, show in Comparative Example G the unsuccessful removal of free PPDI monomer with low-boiling solvent, thereby leading away from the present invention.

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Accordingly, it is requested that the rejection of Claims 1-5, 7-12, 29 and 30 under 35 U.S.C. 102(b) as being anticipated by Rosenberg et al. be withdrawn.

Claims 27 has have been rejected under 35 U.S.C. 103(a) as being unpatentable over Schnabel et al. or Dunlap et al. or Rosenberg et al., each in view of Rizk et al. (U.S. Patent No. 4,624,996) or Lander (U.S. Patent No. 4,101,473).

Claim 27 has been canceled.

Accordingly, it is requested that the rejection of claim 27 under 35 U.S.C. 103(a) as being unpatentable over Schnabel et al. or Dunlap et al. or Rosenberg et al., each in view of Rizk et al. or Lander be withdrawn.

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In view of the foregoing, it is submitted that this application is now in condition for allowance and an early Office Action to that end is earnestly solicited.

Respectfully submitted,

27 Sep 05  
Date

Per [Signature] Reg. No. 30,754  
James L. Lewis  
Reg. No. 24,732

Levy & Grandinetti  
Suite 408  
1725 K Street, N.W.  
Washington, D.C. 20006-1419

(202) 429-4560